Joint and Crack sealing for Concrete Pavement

Office of Rigid Pavements

And Structural Concrete

Hand outs

- ✓ Standard Special Provisions 40-010, 40-011, 41-200
- ✓ Standard Plans A35C & P 20 (2004)
- ✓ ASTM Backer Material Cold & Hot
- ✓ Referral Listing
- ✓ Web site

Joint Problems

- Erosion of pavement support
- Spalling –
- Blowups

Erosion of Pavement Support

Erosion of pavement support

Spalling

Blowup

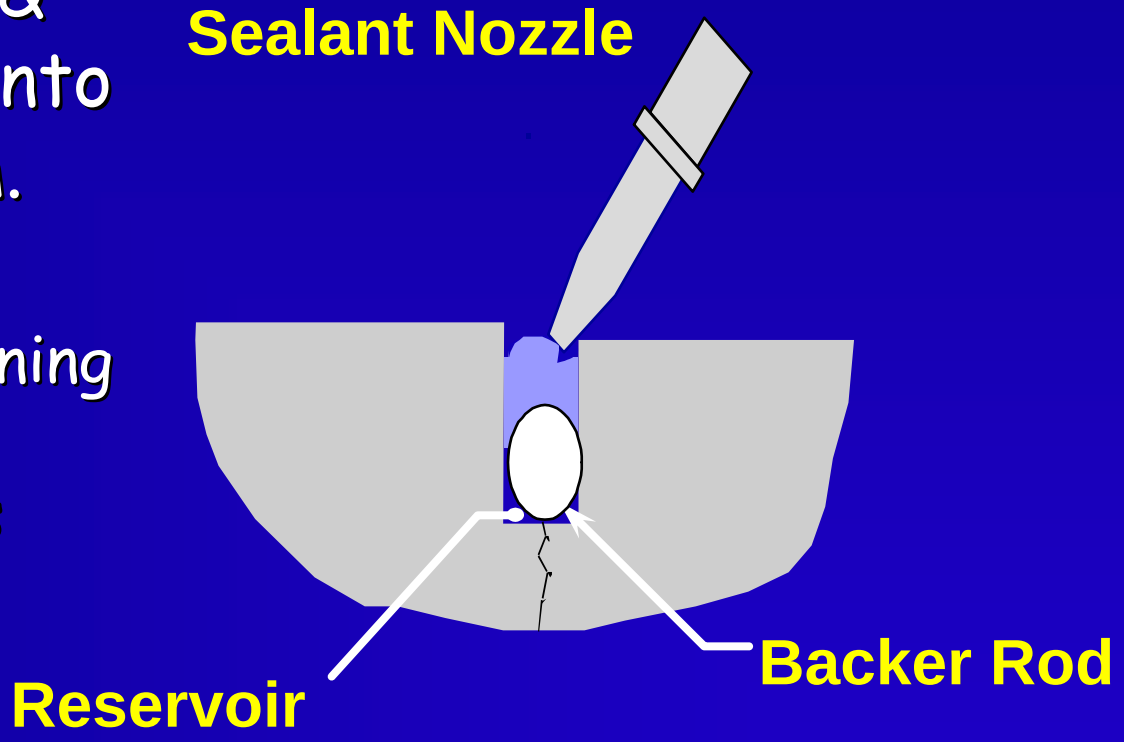
Sealant Failure

Joint and Crack Resealing

- Minimizes water & incompressibles into pavement system.

  Reduces:

  Subgrade softening
  Pumping
  Erosion of fines
  Spalling



NOTES

1. Tie bars and dowels are not shown in joint seal details, see Standard Plans P1, P5, or P10 as applicable.

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

William K. Farnbach
REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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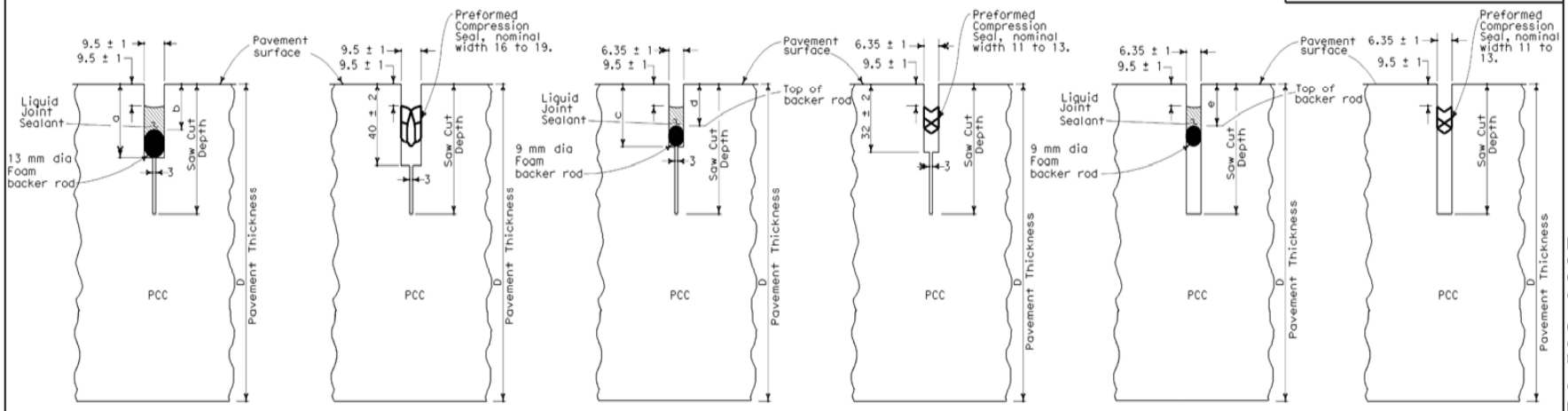
Caltrans now has a web site! To get to the web site, go to: http://www.dot.ca.gov



LIQUID SEALANT | COMPRESSION SEAL

TYPE A1
Transverse Weakened Plane Joints

LIQUID SEALANT | COMPRESSION SEAL

TYPE A2
Longitudinal Weakened Plane Joints

LIQUID SEALANT | COMPRESSION SEAL

TYPE B
Longitudinal or Transverse Weakened Plane Joint

LIQUID SEALANT RESERVOIR DEPTH

LIQUID SEALANT MATERIAL	9.5 mm Joint Width Type A1		6.35 mm Joint Width Type A2		6.35 mm Joint Width Type B
	DIMENSION		DIMENSION		DIMENSION
	a	b	c	d	e
SILCONE	26 ± 1	15 ± 1	23 ± 1	14 ± 1	14 ± 1
ASPHALT RUBBER	30 ± 1	19 ± 1	26 ± 1	17 ± 1	17 ± 1

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

CONCRETE PAVEMENT-JOINT DETAILS

NO SCALE

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

P20

04-27-04

Timely Joint Resealing

Is an effective maintenance technique for the dollars spent and prolonging pavement life.

Most favorable times of year are spring and fall because daily temperatures are moderate.

Sealant Types

- Hot Applied
- Cold Applied
- Preformed

Hot & cold applied generally require backer rod.

Cost of Sealant

Hot applied asphalt sealant

- .15 cents per foot
- will last 2 to 3 years

Silicone sealant with backer rod

- .35 to .45 cents per foot
- will last 6 to 10 years

4 cell preformed compressible seal

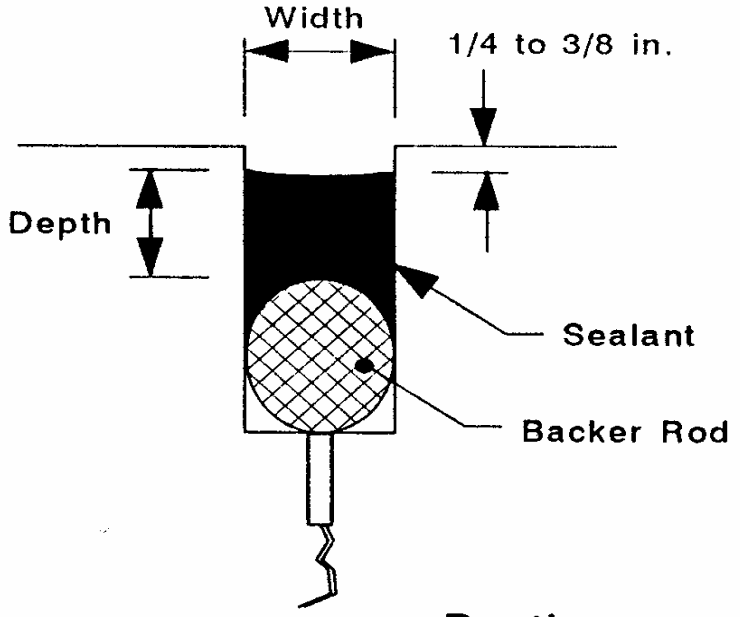
- .45 to .55 cents per foot
- will last 15 to 25 years

Sealant Performance Factors

- Design factors
- Sealant selection
- Joint preparation
- Sealant installation

Reservoir Design

- Sizing is done to permit the sealant to function properly



$$\text{Shape Factor} = \frac{\text{Depth}}{\text{Width}}$$

Liquid Sealant Type	Typical Shape Factor
Hot-Pour	1.0
Silicone	0.5

Resealing Application

- Old sealant removal
- Shaping the reservoir
- Cleaning the reservoir
- Installing the backer rod
- Installing the sealant

Cleaning the Reservoir

Important step

- Goal is to provide good sealant adhesion
- No dust, dirt or visible traces of old sealant should remain.
  - Sandblast
  - Air blow
  - Water Wash

Sandblasting the Joints

Air Blasting

Vacuuming Fines

Hot Applied Sealant

Backer Rod Installation

Backer Rod Installation

Backer Rod Installation

Installation of cold applied sealant

Tooling Silicone

Finished product

Silicone and Backer Rod

Installation of preformed

Installation of preformed

Installation of preformed

6 cell preformed seal

Sealant Installation

- Check sealant manufacturer's recommendations on temperature and opening time
- Make sure reservoir walls are dry
  - moisture will significantly reduce adhesion
- Make sure nozzle fits the reservoir
- Draw the nozzle toward the operator
  - pushing may result in voids and nonuniform sealant cross-section
- Recess the sealant 3/8" below surface

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Bye Thanks